



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,652	06/28/2006	Tadaaki Kaneko	285507US0PCT	7566
22850	7590	01/15/2010		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
LANGMAN, JONATHAN C				
ART UNIT		PAPER NUMBER		
1794				
NOTIFICATION DATE		DELIVERY MODE		
01/15/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

### Office Action Summary

**Application No.**

10/566,652

**Applicant(s)**

KANEKO ET AL.

**Examiner**

JONATHAN C. LANGMAN

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.  
4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 8-15 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 01 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 4/27/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicants' election with traverse of Group II is acknowledged. The traversal is on the grounds that the office has not shown that there is any burden in searching the entire application. These arguments have been considered, but are not found persuasive. There is no requirement in PCT 13.1 and 13.2 of a burden in searching the entire claims to establish a prima facie case of a lack of unity. Applicants have made no argument that the cited references do not disclose the special technical feature.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on September 21, 2009.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8-10, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, rejected under 35 U.S.C. 103 (a) as being unpatentable over Douglass et al. (US 3,163,563).

In regards to claim 8, Douglass et al. teach an article that comprises tantalum or tantalum alloys. The article is molded to a desired shape and then carburized by known methods to provide a carbide layer of the desired thickness. The carburization takes place in a carbon crucible and in a methane atmosphere (col. 3, lines 1-20).

The applicant claims that the article in a product by process form, wherein the process limitations include a vacuum heat treatment under a condition where a native oxide layer of  $Ta_2O_5$  formed on a surface of the tantalum or tantalum alloy is sublimated to remove the  $Ta_2O_5$ ; as well as heat treating the tantalum or tantalum alloy by introducing a carbon source into the vacuum heat treatment furnace to make carbide penetrate from the surface of the tantalum or tantalum alloy.

The examiner takes two separate positions in regards to the Douglass et al. Reference.

The first position is that the processing conditions of a vacuum heat treatment and a heat treatment while introducing a carbon source, are similar processing conditions to those disclosed by Douglass et al. as mentioned above. Even though Douglass et al. do not mention the instantly claimed removal of native oxide  $Ta_2O_5$ , it is inherent that this instant claim limitation would occur in Douglass et al.

It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially

identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The ***prima facie*** case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Douglas et al. teach elevated temperature heat treatments of 2300°C (Table 1) in the presence of methane and a carbon crucible in a reduced atmospheric pressure (vacuum). These processing parameters substantially overlap those process parameters instantly claimed and therefore it is inherent that the native oxide, Ta<sub>2</sub>O<sub>5</sub>, is removed.

The second position is that these parameters of a heat treatment to remove a native oxide, as well as a heat treatment in a vacuum in the presence of a carbon source are all product by process limitations that do not structurally distinguish themselves, from the prior art.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art,

although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113)

The instant claims set forth a product with a final structure that comprises a tantalum carbide layer on a tantalum body with no intervening oxide. Douglass et al. do not teach an oxide layer is present and as seen in the figures there is a sharp interface between the carburized tantalum body and the tantalum carbide layers. Therefore it is the Examiner's position that the structure of Douglass et al. is the same as the structure instantly claimed, wherein little to no patentable weight is given to the product by process limitations instantly claimed.

Regarding claims 9 and 14, the article of Douglass et al. is fully carburized, to include carburization in the bulk of the material, as described above, and therefore reads on the claims as presented.

Regarding claim 10, as seen in Figure 2, the carburization results in a first layer of Ta<sub>2</sub>C and a second uppermost layer of TaC. This multilayer structure reads on the instant structure of claim 10.

Regarding claim 13, the claims set forth that the tantalum carbide material is an electrode. While there is no disclosure that the article of Douglass is an "electrode" as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of

the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim. Since the material of Douglass et al. is the same as instantly claimed, for reasons set forth above, it is said to anticipate the claims as instantly presented, even though Douglass et al. do not describe their material to be an electrode.

Regarding claim 15, the applicant sets forth that the electrode of tantalum carbide is a filament of the tantalum carbide or a heater of the tantalum carbide. These recitations are merely intended use and do not impart any structural limitations to the claims.

The recitation in the claims that the electrode is "a filament" or "a heater" is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and further that the prior art structure is capable of performing the intended use. Given that Douglass et al. disclose the same coated material as presently claimed, it is clear that the article of Douglass et al. would be capable of performing the intended use, i.e. being a filament or a heater, presently claimed as required in the above cited portion of the MPEP.

Claims 8-10, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, rejected under 35 U.S.C. 103 (a) as being unpatentable over Lopez et al. (US 5,916,377).

In regards to claim 8, Lopez et al. teach an article that comprises carburized tantalum or tantalum alloys 9col. 3, lines 50-55). The carburization occurs under a vacuum wherein the furnace was evacuated and flushed with argon gas for 3 cycles in order to remove oxygen from the furnace. The carburization occurs at a temperature of 1700°C for about 10 hours (col. 4, lines 5-15). The carbon source in the vacuum is provided from a packed carbon powder.

The applicant claims that the article in a product by process form, wherein the process limitations include a vacuum heat treatment under a condition where a native oxide layer of Ta<sub>2</sub>O<sub>5</sub> formed on a surface of the tantalum or tantalum alloy is sublimated to remove the Ta<sub>2</sub>O<sub>5</sub>; as well as heat treating the tantalum or tantalum alloy by



introducing a carbon source into the vacuum heat treatment furnace to make carbide penetrate from the surface of the tantalum or tantalum alloy.

The examiner takes two separate positions in regards to the Lopez et al. Reference in order to teach or render obvious the instantly claimed structure.

The first position is that the processing conditions of a vacuum heat treatment to remove oxygen and a heat treatment while introducing a carbon source, are similar processing conditions to those disclosed by Lopez et al. as mentioned above. Even though Lopez et al. do not mention the instantly claimed removal of native oxide Ta<sub>2</sub>O<sub>5</sub>, it is inherent that this instant claim limitation would occur in Lopez et al. since they teach similar processing techniques, as well as the evacuation of all oxygen from the furnace.

It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The ***prima facie*** case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Lopez et al. teach elevated temperature heat treatments of 1700°C in the presence of a carbon source in a reduced atmospheric pressure (vacuum), as well as the evacuation of oxides. These processing parameters substantially overlap those

process parameters instantly claimed and therefore it is inherent that the native oxide,  $Ta_2O_5$ , is removed.

The second position is that these parameters of a heat treatment to remove a native oxide, as well as a heat treatment in a vacuum in the presence of a carbon source are all product by process limitations that do not structurally distinguish themselves, from the prior art.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

The instant claims set forth a product with a final structure that comprises a tantalum carbide layer on a tantalum body with no intervening oxide. Lopez et al. do not teach an oxide layer is present and as seen in the figures there is a sharp interface between the carburized tantalum body and the tantalum carbide layers. Therefore it is the Examiner's position that the structure of Lopez et al. is the same as the structure

instantly claimed, wherein little to no patentable weight is given to the product by process limitations instantly claimed.

Regarding claims 9 and 14, the article of Lopez et al. is fully carburized, to include carburization in the bulk of the material, as described above, and therefore reads on the claims as presented.

Regarding claim 10, the carburization results in a first layer of Ta<sub>2</sub>C and a second uppermost layer of TaC (col. 4, lines 20-27). This multilayer structure reads on the instant structure of claim 10.

Regarding claim 13, the claims set forth that the tantalum carbide material is an electrode. While there is no disclosure that the article of Lopez is an "electrode" as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim. Since the material of Lopez et al. is the same as instantly claimed, for reasons set forth above, it is said to anticipate the

claims as instantly presented, even though Lopez et al. do not describe their material to be an electrode.

Regarding claim 15, the applicant sets forth that the electrode of tantalum carbide is a filament of the tantalum carbide or a heater of the tantalum carbide. These recitations are merely intended use and do not impart any structural limitations to the claims.

The recitation in the claims that the electrode is "a filament" or "a heater" is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and further that the prior art structure is capable of performing the intended use. Given that Lopez et al. disclose the same coated material as presently claimed, it is clear that the article of Lopez et al. would be capable of performing the intended use, i.e. being a filament or a heater, presently claimed as required in the above cited portion of the MPEP.

Claims 8, 9, and 11-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Murakami et al. (US 5,973,400).

Regarding claims 8, 9, 11, 12, and 14, Murakami et al. teach a tantalum carbide diffusion layer formed on a surface of a wiring groove on a semiconductor substrate by sputtering with a tantalum target in a carbon source (col. 3, lines 54-67). The final product results in a TaC layer, that reads on the instant limitation of "the tantalum carbide is formed by the penetration of carbon into all areas of the tantalum or tantalum alloy." Murakami does not teach the same product by process limitations of "tantalum carbide formed by patterning tantalum or tantalum alloy into a prescribed shape on a semiconductor substrate, heat treating the tantalum or tantalum alloy under a condition where a native oxide layer of Ta<sub>2</sub>O<sub>5</sub> formed on a surface of the patterned tantalum or patterned tantalum alloy is sublimated, removing the patterned Ta<sub>2</sub>O<sub>5</sub> from the surface of the patterned tantalum or patterned tantalum alloy, heat treating the tantalum or tantalum alloy by introducing a carbon source, and penetrating carbon from the surface of the patterned tantalum or patterned tantalum alloy". However this process results in a final structure comprising patterned TaC on semiconductor substrate wherein no oxygen is present.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

unpatentable even though the prior product was made by a different process.”, (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Since that carbon of Murakami will be present in all areas of the tantalum material due to the codeposition, it is said that the TaC layer of Murakami has the same structure as the instantly claimed TaC layer, wherein carbon is formed in all areas of the TaC material, and furthermore since the layer is formed without the presence of oxygen, no oxygen will be present within the TaC layer.

The limitation of being patterned is a functional limitation that is given little patentable weight. The applicant has failed to include the design of the “pattern” and merely states that it forms a prescribed shape. Therefor the TaC formed on the surface of the wiring grooves is said to have a prescribed shape and therefor has the same structure of the instantly claimed pattern.

Regarding claim 13, the claims set forth that the tantalum carbide material is an electrode. While there is no disclosure that the article of Murakami is an “electrode” as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that “if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of

the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim. Since the material of Murakami et al. is the same as instantly claimed, for reasons set forth above, it is said to anticipate the claims as instantly presented, even though Lopez et al. do not describe their material to be an electrode.

Regarding claim 15, the applicant sets forth that the electrode of tantalum carbide is a filament of the tantalum carbide or a heater of the tantalum carbide. These recitations are merely intended use and do not impart any structural limitations to the claims.

The recitation in the claims that the electrode is "a filament" or "a heater" is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and further that the prior art structure is capable of performing the intended use. Given that Murakami et al. disclose the same coated material as presently claimed, it is clear that the article of Murakami et al. would be capable of performing the intended use, i.e. being a filament or a heater, presently claimed as required in the above cited portion of the MPEP.

Claims 8, 9 and 13-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Garg et al. (US 5,126,206).

Garg et al. teach a tantalum electrode, which is a filament that is carburized through a process that involves a two step heat treatment as instantly claimed. The first heating step includes a heat treatment in a vacuum at 1800 °C. The second heat treatment involves a temperature of 2100°C for 12 hours, in the presence of a carbon source (CH<sub>4</sub>) (col. 10, lines 44-65).

Garg et al. are silent to the removal of Ta<sub>2</sub>O<sub>5</sub> during the first heat treatment. However, it has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The ***prima facie*** case can be rebutted by



evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Since this heat treatment taught by Garg is similar to the heat treatment instantly claimed, it is inherent that the tantalum filament will behave in the same manner as instantly claimed, i.e.  $Ta_2O_5$  will be removed from the surface of the Ta filament. And furthermore it is inherent that the entire Ta filament in all areas will be penetrated with carbon.

A second position in view of Garg, is that these instantly claimed parameters of a heat treatment to remove a native oxide, as well as a heat treatment in a vacuum in the presence of a carbon source are all product by process limitations that do not structurally distinguish themselves, from the prior art.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (*In re Thorpe*, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (*In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

The instant claims set forth a product with a final structure that comprises a tantalum carbide layer on a tantalum body with no intervening oxide. Garg et al. do not teach an oxide layer is present and teach that the surface is carburized well. Therefore it is the Examiner's position that the structure of Garg et al. is the same as the structure instantly claimed, wherein little to no patentable weight is given to the product by process limitations instantly claimed.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art references in the search Report are considered to be cumulative to the rejections set forth above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN C. LANGMAN whose telephone number is (571)272-4811. The examiner can normally be reached on Mon-Thurs 8:00 am - 6:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCL

/Timothy M. Speer/  
Primary Examiner, Art Unit 1794